

# Does Intelligence Provide Survival Value?

BY JOHN CAIRNS, JR.

*In the long history of humankind (and animal kind too), those who learned to collaborate and improvised most effectively have prevailed.*

**Charles Darwin**

*As for a future life, everyone must judge for himself between conflicting vague probabilities.*

**Charles Darwin**

*The study and measurement of human intelligence is one of the most controversial subjects in psychology.*

**Carl Sagan, *The Dragons of Eden*, 1977**

*Intelligence – (1) the ability to learn or understand or to deal with new or trying situations (2) the skilled use of reason*

**Merriam-Webster's Online Dictionary**

## Overview

Intelligence is defined as a general mental capability that involves the ability to reason, plan, solve problems, think abstractly, comprehend ideas and language, and learn. It can also be defined as the ability to acquire and apply information from the environment to modify behavior. Intelligence, including adaptability, has provided survival value to the genus *Homo* for 2 million years and for the sole surviving species *Homo sapiens* for approximately 200,000 years. This intelligence was adequate when humankind was spread thinly over the planet in small tribes. However, in the last few centuries, exponential human population growth

---

*John Cairns, Jr., Ph.D., is University Distinguished Professor of Environmental Biology Emeritus in the Department of Biological Sciences at Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.*

has increased the numbers from a few million to nearly 7 billion, and predictions are as high as 9 billion by 2050. In the early part of the twenty-first century, both the global financial meltdown and the deleterious effects of climate change raise the question of whether intelligence has survival value for huge populations living mostly in urban areas and effectively isolated from the natural systems in which *Homo* evolved and survived. This situation raises the interesting question: "Can individual intelligence have selective (i.e., survival) value for a globalized species?" An early explanation of the parallels of evolutionary development of biological entities other than humans (e.g., primates) evaluates their ability to think in the abstract (Yoerg, 2002), which has survival value.

## Beyond Anthropocentrism

Anthropocentrism is the belief that humans hold a special place in nature — being centered primarily on humans and human affairs. It is the practice, conscious or otherwise, of regarding the existence and/or concerns of human beings as the central fact of the universe. This concept is similar, but not identical, to the practice of relating all activities in the universe to human experience (en.wikipedia.org/wiki/Anthropocentric).

Economic globalization has clearly increased the interdependence of most members of the human species. However, global climate change affects all species on Earth. Humankind is utterly dependent upon the biospheric life support system, which includes natural capital, upon which all human capital depends, and the ecosystem services it provides, upon which many species, including *Homo sapiens*, depend.

## Crucial Questions for the Twenty-First Century

(1) Can sovereign nations survive the social disruptions caused by rapid, irreversible climate change?

(2) Can *Homo sapiens* survive drastic, irreversible climate changes affecting food and water supplies, plus the probable disequilibrium of the biospheric life support system?

The volume *The State of the World* (Starke, 2009) gives an abundance of disquieting information. “It is now virtually certain that children born today will find their lives preoccupied with a host of hardships created by an inexorably warming world” (Flavin and Engelman, 2009, p. 5). “Taking advantage of the inevitable uncertainties and caveats contained in leading climate assessments, a handful of climate skeptics—many of them PhDs with oil industry funding—managed to position climate change as a scientific debate rather than a grim reality” (Flavin and Engelman, 2009, p. 6). This situation has improved in 2009, but, in the United States, many citizens believe “the jury is still out.” A recent publication (Marshall, 2009) states: “A record number of Americans—41 percent—believe that the seriousness of global warming is ‘exaggerated’ in the media....”

The answer to whether sovereign nations can survive the social disruptions caused by rapid, irreversible climate change [question (1)] depends on how soon greenhouse gas emissions can be brought within Earth’s assimilative capacity for them. “The political will for change is building, thanks to the strong base in science and widening public awareness of climate change and its risks” (Flavin and Engelman, 2009, p. 8). However, Earth’s assimilative capacity for carbon dioxide is decreasing (e.g., oceans, wetlands, forests), and anthropogenic carbon dioxide emissions are still rising rapidly (e.g., Irwin, 2009). In addition, positive feedback loops, particularly of carbon dioxide and methane, are increasing (e.g., Cairns, 2008). Finally, a new study (NOAA, 2009) “reaches a powerful conclusion about the climate change caused by future increases of carbon dioxide: to a large extent, there’s no going back.”

Cairns (2009) discusses the inability of sovereign nations to protect their citizens from the consequences of global climate change, rapid depletion of petroleum, global financial meltdown, ecological overshoot, and overpopulation (i.e., exceed-

ing Earth’s carrying capacity for humans). These issues affect national security. Gati (2009) asks: “Will the economic and financial crisis degenerate into violent social explosions?” Orlov (2008) writes about his first hand experience with the social collapse of the former Soviet Union and compares it to the present situation in the United States where he is now a resident. Most US citizens are repelled by even a discussion of the probability of a similar event in the United States. However, Orlov offers a surprising amount of hope in the book. He (Orlov, 2009, p. ix) does note: “People generally find it hard to act on knowledge that contradicts their everyday experience. The experience must come first, even if it is second-hand; hence all the support groups for people who want to change their lives or habits.” Orlov (2009, p. 16) continues: “Perhaps it is difficult for a people that attempt to quantify every kind of risk in terms of monetary value to think about a type of risk that can only be compensated for through accepting a different living arrangement.... Perhaps most importantly, America’s national mythology makes it anathema to think of collective failure. All failure is to be regarded as individual failure—something that happens to somebody else, or to you, but only if you happen to be unlucky or do not try hard enough.” In short, the status quo is unsustainable but changing the collective lifestyle to arrest global climate change is unthinkable. Individuals who cling to an unsustainable paradigm clash with those who are persuaded by scientific evidence that a new paradigm is needed.

The answer to the possibility that *Homo sapiens* could survive drastic, irreversible climate change affecting food and water supplies, plus the probable disequilibrium of the biospheric life support system [question (2)], depends on several factors.

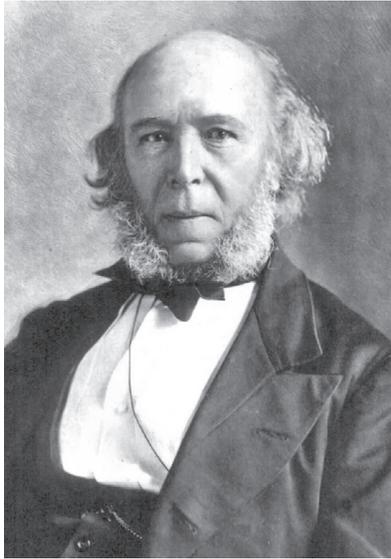
*Survival of the Fittest*—Darwin’s theory of natural selection is often expressed in Herbert Spencer’s claim that, among competing organisms, “the fittest survive.” Biological fitness is often defined as the extent to which an organism is adapted to or able to produce offspring in a particular environment (*American Heritage Dictionary of the English Language Online*). In other words, a species is suit-

able because it survived in a particular situation and left offspring. Estimates are that humans share the planet with over 30 million other species. Major climate changes have added stress to the survival of all these species, and the probability is high that conditions will worsen in the foreseeable future. With such formidable competition and worsening conditions in an increasingly alien planet, how can humans survive? The predictable answer is *intelligence*. About 1.4 billion people now live in extreme poverty (Flavin and Engelman, 2009, p. 8). At least 2 billion more lack potable water and adequate health care and housing, are not well nourished, and are vulnerable to disease. The global financial meltdown has worsened this deplorable situation. Out of nearly 7 billion people, 3 billion are at considerable risk if conditions worsen significantly (e.g., Lovelock, 2009). However, other species are at comparable risks, so human intelligence may still have appreciable survival value.

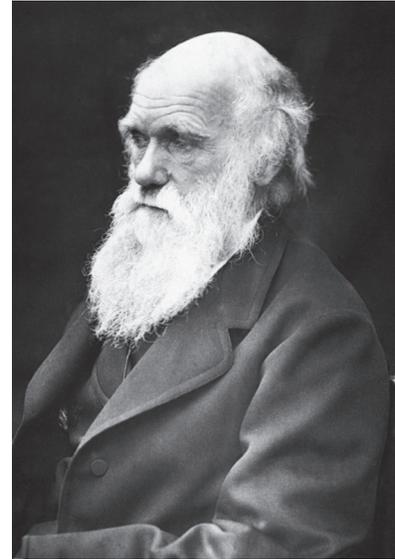
**Multiple Intelligences**—Gardner (2006, pp. 8-18) lists a series of human intelligences: (1) musical intelligence (2) bodily-kinesthetic intelligence, (3) logical-mathematical intelligence, (4) linguistic intelligence, (5) spatial intelligence, (6) interpersonal intelligence, (7) intrapersonal intelligence. An individual may have all seven, but in different degrees for each intelligence for each individual.

Gardner (2006) also lists naturalist intelligence: “Today few people in the developed world are directly dependent on naturalist intelligence.” Still, if global climate change impairs agricultural production, Earth will no longer be able to support anything like 7 billion people, and hunting/gathering aided by naturalist intelligence may again have

considerable survival value. One way that support will decrease is stated by Economist Lord Nicholas Stern who believes that, if humankind does not deal with climate change, it will face extended world war (Hanley, 2009), which will affect food production — so foraging for natural foods should have major survival value under these new conditions.



Herbert Spencer



Charles Darwin

before the Agricultural Revolution, failure to have adequate naturalist intelligence resulted in disease and death and an inability to compete with tribes with superior naturalist intelligence.

Herbert (2009) reports on some studies of Peter Kahn (University of Washington) and his colleagues to determine “what benefit — if any — people get from high-quality technological versions of nature. In one experiment, for example, they installed plasma TV ‘windows’ in workers’ otherwise windowless offices for a period of 16 weeks, and then took various measures of psychological function. They found that those with the ‘views’ of parkland and mountain ranges had a greater sense of well-being, clearer thinking, and a greater sense of connection to the natural world.... only the actual view of the outdoors had a calming effect; the plasma window was no more restorative than the blank wall. In other words, the technological version of nature—even when it came in HDTV quality —couldn’t fool the neurons....Marc Berman [University of Michigan] believes that nature actually shifts human brains from one processing mode to another.” This signif-

However, in order to take immediate effective action to avoid the dire climate change scenario of Lord Nicholas Stern, humankind must have naturalist intelligence — at least equal to that of tribal *Homo sapiens* who lived in intimate association with natural systems. Be-

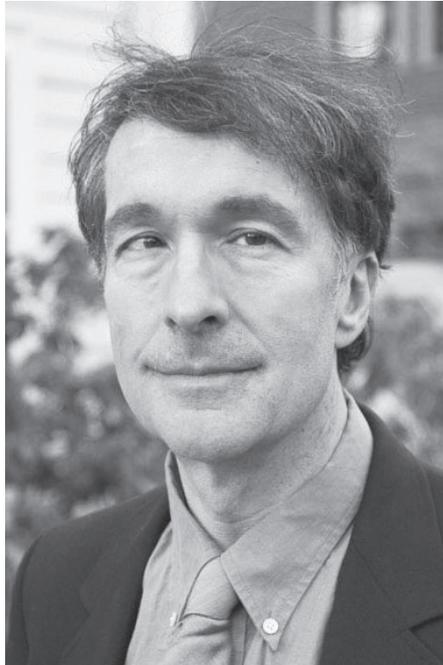
icant problem should be checked by other research investigators. However, if a valid concept, then many citizens will need at least some exposure to natural systems, which constitute humankind's biospheric life support system — even then efforts to protect and nurture it will, at best, be inadequate and, at worse, will fail. The alternative will probably be keeping the human population within Earth's carrying capacity by starvation, disease, and death.

**Resource Wars**—Klare (2009) remarks that, with many millions of unemployed globally, unrest and strife may well follow. The food price riots that erupted in spring 2008 indicated the speed with which economically related violence can spread. Some resource wars are likely, but not inevitable. Although not usually labeled as resource wars, conflicts are definitely more common when oil, water, valuable minerals, or other scarce resources are present in one nation and scarce or non-existent in another. All the above are perfect recipes for social instability. “At a popular level, however, the basic picture is clear enough: continued economic decline combined with a pervasive sense that existing systems and institutions are incapable of setting things right is already producing a potentially lethal brew of anxiety, fear, and rage. Popular explosions of one sort or another are inevitable” (Klare, 2009). In much of the world, where an ever increasing disparity of wealth exists, a clash is developing between the “haves” and “have-nots.” Increasingly, people feel that both they and the environment have been exploited to increase further the wealth of a tiny (i.e., 1-2 percent) portion of the population. Finally, war is a stupendous consumer of resources, which creates further anxiety and unrest.

### The Horrors of Default

Default is the failure to act, inaction, or neglect (Dictionary.com). What humankind fails to consider are the consequences of the decision to do less

than is essential to cope with issues such as global climate change, overpopulation, unsustainable rate of depletion of resources (ecological overshoot), misuse of the commons, species impoverishment (drastic reduction of biodiversity), and irreversible damage to the biospheric life support system. Failure to act ensures that the laws of nature will prevail as they have for billions of years. W. Durant and A. Durant (1968) remark: “History is a fragment of biology: the life of man is a portion of the vicissitudes



Harvard Psychologist Howard Gardner

of organisms on land and sea (p. 18)... So the first biological lesson of history is that life is competition. Competition is not only the life of trade, it is the trade of life — peaceful when food abounds, violent when the mouths outrun the food... The second biological lesson of history is that life is selection. In the competition for food or mates or power some organisms succeed and some fail” (p. 19). W. Durant and A. Durant (1968, p. 19) define nature as meaning total reality and its processes. “Nature loves difference as the necessary material of selection and evolution; identical twins differ in a hundred ways, and no two peas are alike” (Durant and Durant, 1968, p. 20). “The third biological lesson of history is that life must breed.... She [nature] has a passion for quantity as prerequisite to the selection of quality...” (Durant and Durant, 1968, p. 21).

By failing to take effective action on the issues related to global climate change, humankind has moved to the default position (i.e., Mother Nature, natural law). However, Mother Nature neither bargains nor forgives transgressions of natural law (Cairns, 2008). Politicians can plan for greenhouse gas emissions reduction for 2050, but humankind will suffer from global climate change until greenhouse gas emissions are reduced to at least 350 ppm<sub>e</sub> (carbon dioxide equivalent).

### Conclusions

Humankind has been living an unsustainable

lifestyle for the last part of the twentieth century and the first part of the twenty-first century. The 1.4 billion people living in extreme poverty are already in a high risk situation. The over 2 billion lacking adequate nutrition, potable water, medical care, and housing are in precarious circumstances. The comparatively affluent are still vulnerable to pandemic disease, for which those living in poverty are an ideal breeding ground. All species share a finite planet and a common fate if climate change results in less favorable conditions. Probably, regardless of the severity of the effects of rapid global climate change, some species are likely to survive as they did in the earlier five great extinctions. And, as in the past, surviving species will probably evolve into a stunning diverse array of new life forms.

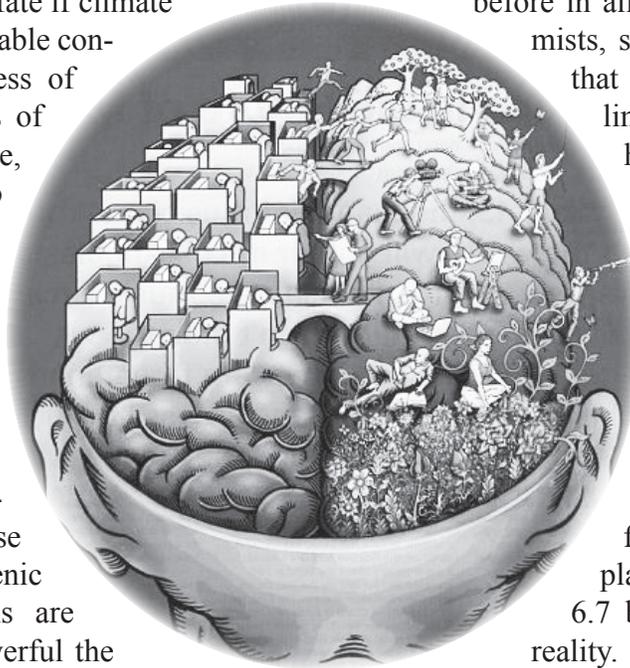
Future climates cannot be predicted because reductions in anthropogenic greenhouse gas emissions are unknown, as are how powerful the positive feedback loops resulting from release of sequestered carbon will be. If intelligence means using scientific evidence as the basis for changing human lifestyles to be congruent with natural law, humankind is not displaying much intelligence.

Arguably, the most important issue is that *Homo* was a small group species for approximately 2 million years and, for most of that time, was spread thinly over the planet. Now it is in enormous groups, closely packed together, and occupying all habitable areas. Furthermore, the human population is growing exponentially, and the amount of arable land is decreasing. Humankind is in excess of Earth's carrying capacity. Pollutants abound. Worse yet, discussion of human population growth is taboo. No definition of intelligence is compatible with humankind's present actions.

However, a major factor in diverting *Homo*'s

successful use of naturalist intelligence was the discovery of what seemed like endless supplies of cheap petroleum. Petroleum fostered a strong belief in technology, which delivered personal transportation; elevators that made huge buildings accessible to large numbers of people on small parcels of land; and corporations, including agribusiness, that produced a cornucopian flow of food and material goods per capita, which had not been experienced before in all of human history. Economists, such as Julian Simon, stated that resources were no longer limiting (Simon, 1981), and if humankind could make endless substitutes for depleted resources, such concepts as carrying capacity and Malthusian scarcity of food would be outmoded. However, peak oil (some believe it occurred in 2005), limitations of nuclear reactors, and cold fired generating electric plants (e.g., toxics) have given 6.7 billion people a glimpse of reality. The numerous food riots of mid-2008 and the global financial melt-down of 2008 have destroyed any cornucopian illusion.

Suddenly, the concept of the survival of the fittest has returned to human consciousness on the anniversary of Darwin's 200<sup>th</sup> birthday and the sesquicentennial of the publication of the *Origin of Species*. Darwin first proposed survival of the fittest, which was ignored for many years, but the shocking events of recent history have revived the concept. However, human society has no context to help it cope with the climate changes that are driven, in part, by anthropogenic greenhouse gas emissions. Without a context into which to incorporate and act on this information, responses to the rapid changes have been inadequate and faulty. Much of humankind's intelligence is used in denial, such as "global warming is a hoax perpetrated by scientists," or "too much uncertainty exists in science"



(as if uncertainty were not present in all aspects of life). The news media have used the illusion of balance to ensure that climate change deniers are given equal time in the media outlets, despite the preponderance of evidence being all on one side—global warming change is occurring and anthropogenic greenhouse gases are a major component of the problem. In short, huge amounts of carbon were sequestered underground (e.g., petroleum, coal, natural gas), and humankind extracted it and burnt it, markedly increasing atmospheric greenhouse gases. How much intelligence does it take to understand this concept?

Biological selection and evolution can resolve the disparity in humankind's unsustainable lifestyle, but this alternative is effective only at a horrendous cost in human lives. Societal evolution (as opposed to genetic) has not proven effective thus far. It might become effective if given enough time (e.g., Wilson, 1975). At present, enough time is not available. However, natural selection has worked well for billions of years, often resulting in spectacular reductions in population size. Out of the millions of species on the planet, who can say which will have the essential fitness to survive in a changing world? Humans view themselves as the most intelligent species—animals display intelligence, but it is mostly regarded as inferior to human intelligence. *Homo sapiens* must endeavor to display its intelligence effectively. Even though it is presently impossible to predict whether intelligence has selective value, the twenty-first century should provide an answer for the developing set of conditions. What works in the twenty-first century may not be effective for the next great test of survival. Darwin would have been enthralled!

#### ACKNOWLEDGMENTS

I am indebted to Darla Donald for transcribing the handwritten, first draft of this manuscript and providing editorial assistance in its publication. I thank Karen Cairns, Paula Kullberg, and Paul Ehrlich for calling useful references to my attention.

#### REFERENCES

- Cairns, J., Jr. 2009. "Sovereignty in an era of klimakatastrophes." *Asian Journal of Experimental Sciences* 23(1):1-6.
- Cairns, J., Jr. 2008. "Mother Nature does not bargain or forgive." *Commentaries* June24 ([www.johncairns.net](http://www.johncairns.net)).
- Durant, W. and Durant, A. 1968. *The Lessons of History*. New York : Simon and Schuster.
- Flavin, C. and Engelman, R. 2009. "The perfect storm." In *The State of the World*, L. Starke, ed. New York: W. W. Norton & Co.
- Gardner, H. 2006. *Multiple Intelligences*. New York: Basic Books.
- Gatinois, C. 2009. "After the financial crisis, civil war? Get ready to "leave your region. . ." *Truthout* Feb27 (<http://www.truthout.org/022709F>).
- Hanley, C. J. 2009. "Lord Nicholas Stern paints dire climate change scenario: mass migrations, extended world war." *Huffington Post* Feb21 ([http://www.huffingtonpost.com/2009/02/21/lord-nicholas-stern-paint\\_n\\_168865.html](http://www.huffingtonpost.com/2009/02/21/lord-nicholas-stern-paint_n_168865.html)).
- Herbert, W. 2009. In our nature. *Newsweek Web Exclusive* Feb12 (<http://www.newsweek.com/id/184454>).
- Irwin, A. 2009. "Climate change 'more serious' as emissions soar." *Science and Development Network* Feb16 (<http://www.scidev.net/en/climate-change-and-energy/fossil-fuels/news/climate-change-more-serious-as-emissions-soar.html>).
- Klare, M. T. 2009. "A planet at the brink: will economic brushfires prove too virulent to contain?" *Tom Dispatch.com* Feb25 (<http://www.tomdispatch.com/post/175038>).
- Lovelock, J. 2009. *The Vanishing Face of Gaia: A Final Warning*. New York: Basic Books.
- NOAA. 2009. "New study shows climate change largely irreversible." Jan26 ([http://www.noaanews.noaa.gov/stories2009/20090126\\_climate.html](http://www.noaanews.noaa.gov/stories2009/20090126_climate.html)).
- Marshall, C. 2009. Record number of American say global warming is exaggerated in the media. *Energy and Environment* 12Mar <http://www.eenews.net/climatewire/2009/03/12/6/>.
- Orlov, D. 2008. *Reinventing Collapse: The Soviet Example and American Prospects*. Gabriola Island, Canada: New Society Publishers.
- Simon, J. A. *The Ultimate Resource*. Princeton, NJ: Princeton University Press.
- Starke, L., ed. 2009. *The State of the World*. New York: W. W. Norton & Co.
- Wilson, E. O. 1975. *Sociobiology: The New Synthesis*. Cambridge, MA: Harvard University Press.
- Yoerg, S. I. 2002. *Clever as a Fox: Animal Intelligence and What It Can Teach Us about Ourselves*. Cambridge, MA: Harvard University Press.